V-Series

(PROFIBUS-DP)

Operation Manual

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-	V-Series Profibus Operation Manual	2022-6-1	Nakahama	-	Mori
Rev.No.	Description	Date (yy-mm-dd)	Prepared	Checked	Approved
SEIBU ELECTRIC & MACHINERY CO.,LTD.			ELECTRIC ACTUATOR DIVISION		

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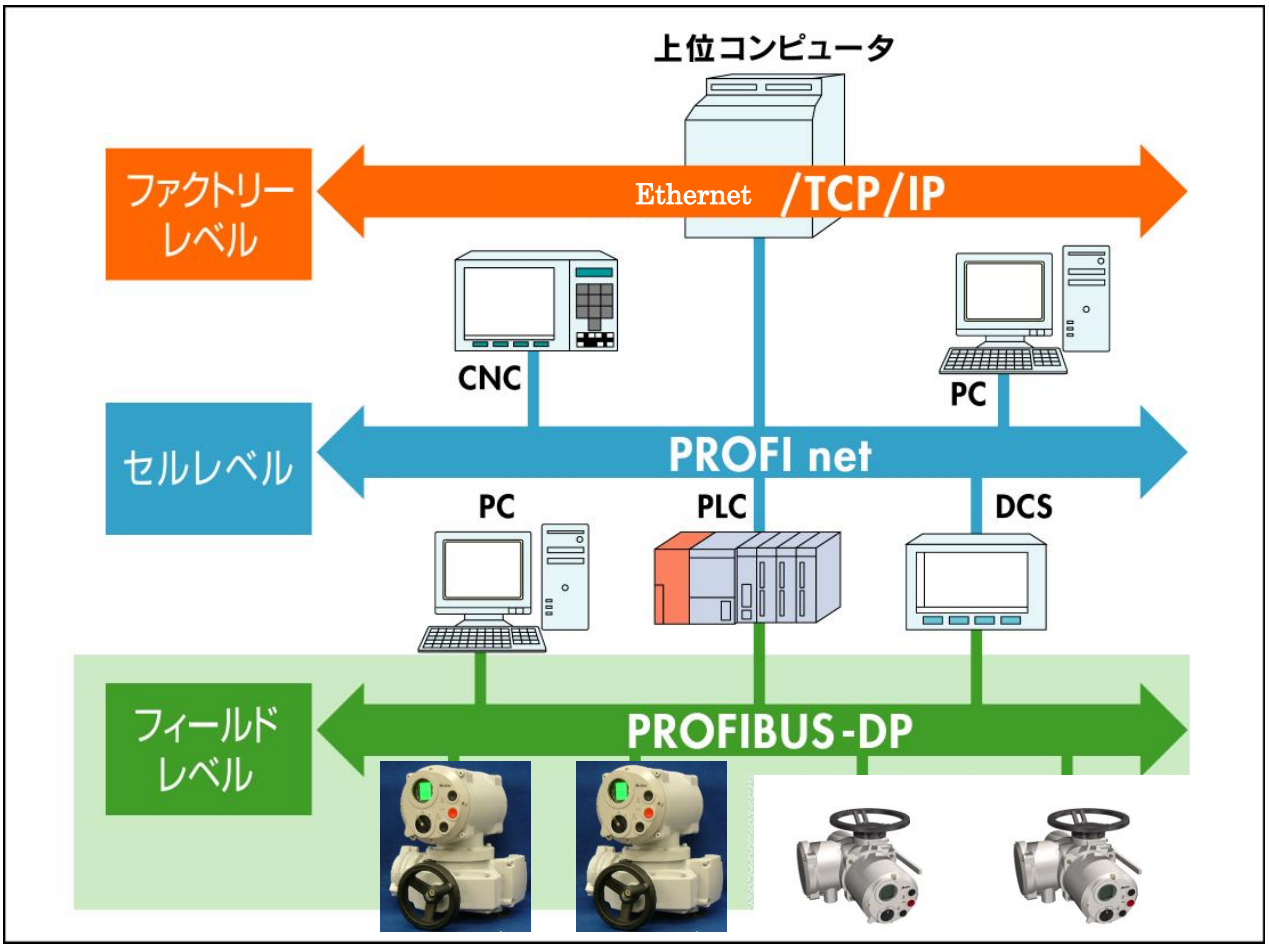
1) Outline

PROFIBUS-DP communication unit (PROFIDP-BRG) is a communication unit for PROFIBUS-DP that is suitable for Seibu valve controller. (For V-series)

PROFIBUS is an open field bus communication system that is extensively used for factory automation process. (Global standard IEC61158 certification)



2) Specification Please refer to Profibus official manual for specification not listed below.

Technical data:General data PROFIBUS－DP

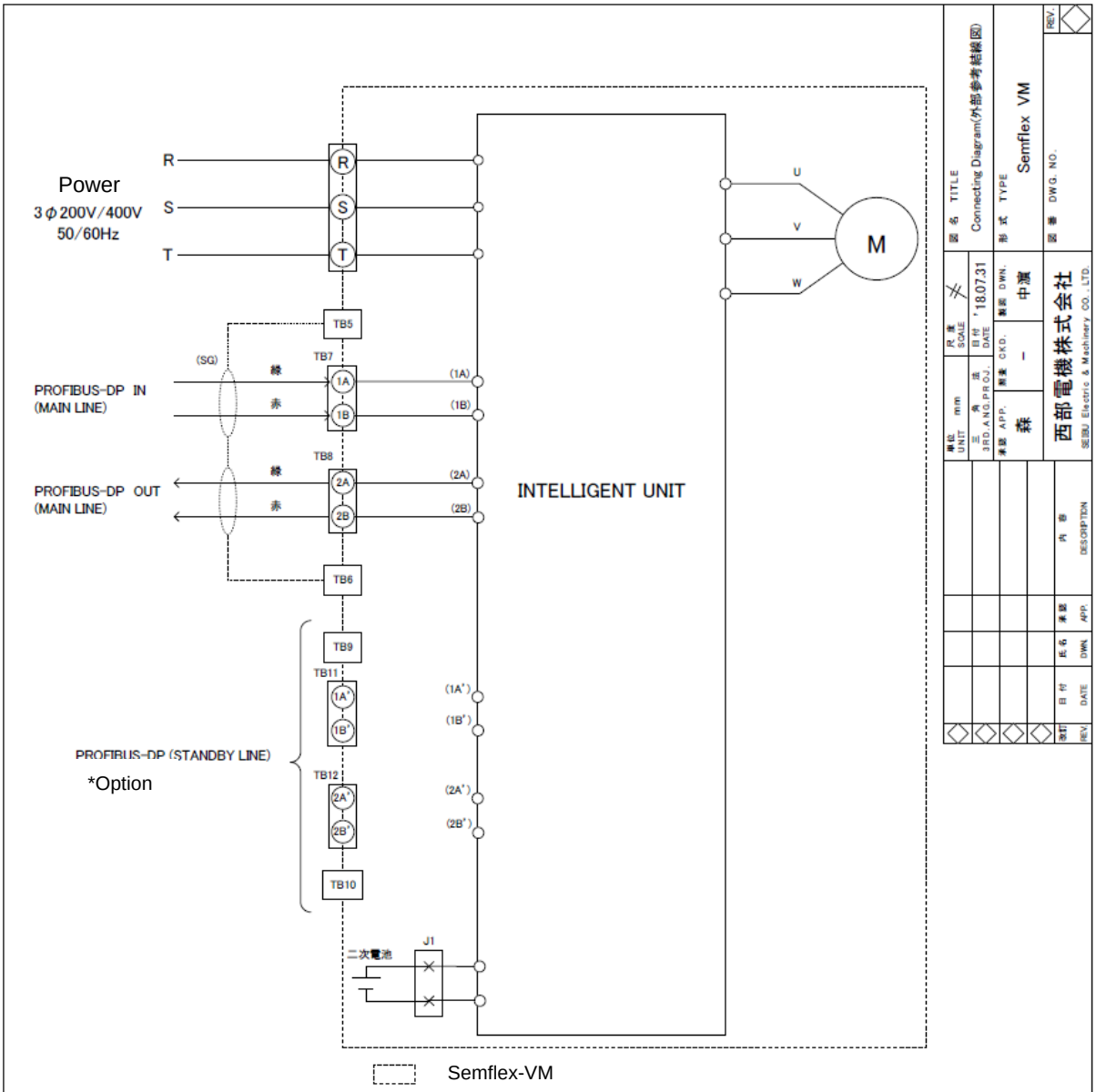
Communication protocol	PROFIBUS-DP	
Interface	RS-485	
Transmission rate / Cable length	Baud rate (kbit/s)	Cable length (without repeater)
	9.6 19.2 93.75 187.5 500 1500 12000	1200m 1200m 1200m 1000m 400m 200m 100m
Transmission Wiring	Twist pair cable（SIEMENS：6XV1830-0EH10）	
Station Type	DP Master class 1 DP Master class 2 DP slave	
Number of stations	32 stations without repeater, with repeater expandable up to 125	
Communication setting	Data ：8bit Parity ：Odd number Stop bit：1bit	
Encoding method	Non Return to Zero	

Data of actuator controls（VM／VP） series with PROFIBUS－DP interface:

Electronic controls	Integral controls Seibu Semflex－series
Baud rate recognition	Automatic
Command signals	OPEN STOP CLOSE Proportion control：Option
Feedback signals	Limit switch OPEN／CLOSE Torque switch OPEN／CLOSE Opening／Closing signals Position REMOTE Valve position（Option） Self diagnosis data (Option)
Fault signals	Motor protection tripped Torque abnormal Other abnormal

3) Wiring Diagram

＜Semflex-VM＞



■SW1 [SKIP]
Switching connect and disconnect with INTELLIGENT UNIT of MAIN LINE
Normal : Connecting with INTELLIGENT UNIT (*)
SKIP : Disconnecting with INTELLIGENT UNIT

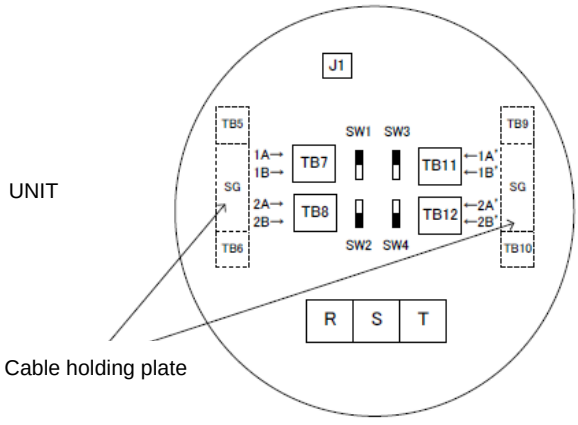
■SW2 [Termination Resistor]
Switching MAIN LINE Termination Resistor ON/OFF
ON : Termination Resistor ON
OFF : Termination Resistor OFF (*)

■SW3 [SKIP] (Option)
Switching connect and disconnect with INTELLIGENT UNIT of MAIN LINE
Normal : Connecting with INTELLIGENT UNIT (*)
SKIP : Disconnecting with INTELLIGENT UNIT

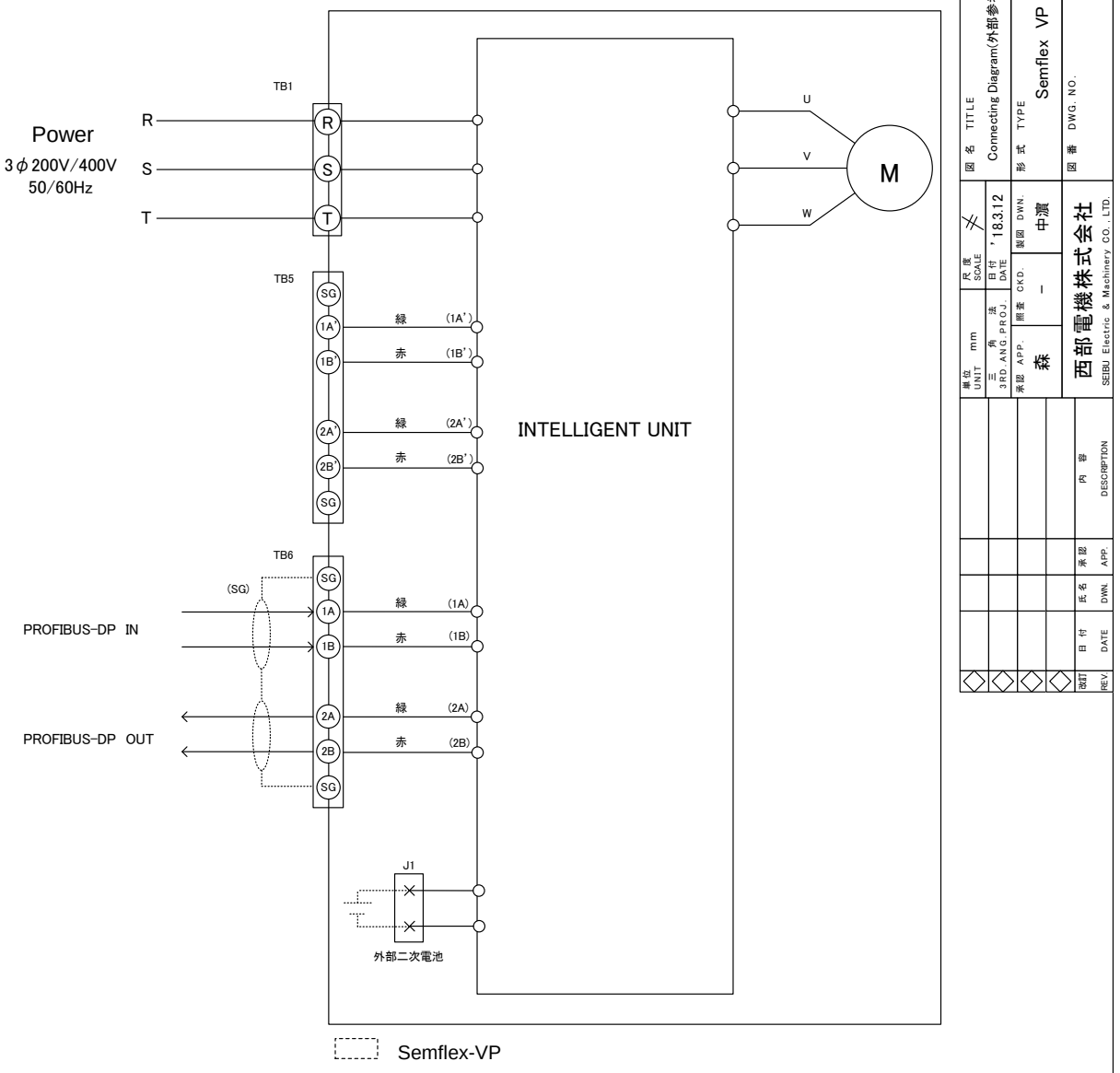
■SW4 [Termination Resistor] (Option)
Switching MAIN LINE Termination Resistor ON/OFF
ON : Termination Resistor ON
OFF : Termination Resistor OFF (*)

(*) is Standard setting.

Terminal Array



＜Semflex-VP＞

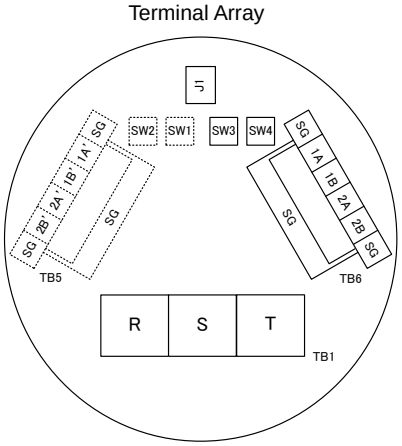


■SW1,SW3 [SKIP]
Switching connect and disconnect with INTELLIGENT UNIT of MAIN LINE
Normal : Connecting with INTELLIGENT UNIT (*)
SKIP : Disconnecting with INTELLIGENT UNIT

■SW2,SW4 [Termination Resistor]
Switching MAIN LINE Termination Resistor ON/OFF
ON : Termination Resistor ON
OFF : Termination Resistor OFF (*)

(*) is Standard setting.

Terminal Array



Not use dotted part (TB5,SW1,SW2)

4) PROFIBUS Cable Connection

■Connecting Cable

Connecting cable for PROFIBUS, which Seibu recommend is following models.
Refer to Siemens or Fujikura related manual for cable specification, connecting method and so on.

Maker	Model
Siemens	6XV1830-0EH10
Fujikura	F-LINK-P

■Recommended Bus Connector

It is recommended to use connector called "bus connector" on RS-485 as PROFIBUS connecting cable. PROFIBUS cable is easily connected by using this connector.
Recommended bus connector is listed as below.
Refer to Siemens or Phoenix Contact related manual for connector specification, connecting method and so on.

Maker	Model
Siemens	6ES7 972-0BA11-0XA0
	6ES7 972-0BB11-0XA0
	6ES7 972-0BA40-0XA0
	6ES7 972-0BB40-0XA0
	6ES7 972-0BA50-0XA0
	6ES7 972-0BB50-0XA0
Phoenix Contact	SUBCON-PLUS-PROFIB/PG/SC2

5) Electric Unit Environmental Performance

Ambient temperature	-5℃～80℃	
Relative humidity	RH 45～95%	
Vibration-resistance	50Hz/10G 1hr	(JIS C 0040)
Impact-resistance	30G/11ms X,Y,Z Each 3 time	(JIS C 0041)
Noise-resistance	INPULS±2000V clear	(IEC61000-4-4)
Static electricity	contact±8kv In the air±15kv	(IEC61000-4-2)
Surge (Thunder)	4kV（1.2/50μs）Protection	(IEC61000-4-5)
Conductive disturbance	10V/m clear	(IEC61000-4-6)
Electric wave noise	10V/m clear	(IEC61000-4-3)

6) Interface Specification

・Profibus communication port

Item	Specification
Signal level	RS-485
Baud rate	Max 12Mbps
Parity	Even number
Data length	8Bit
Stop bit	1Bit
Connector	D-Sub 9 pin

・Screw connecting type plug allocation (Terminal block board side)

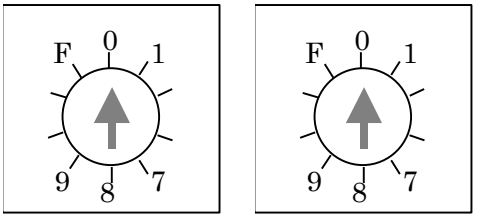
＜Semflex-VM＞

Communication	Terminal block	Terminal No. (Signal Name)	I/O
MAIN	TB7	1A	IN
		1B	
	TB8	2A	OUT
		2B	
STANDBY	TB11	1A’	IN
		1B’	
	TB12	2A’	OUT
		2B’	

＜Semflex-VP＞

Communication	Terminal block	Terminal No. (Signal Name)	I/O
MAIN	TB6	1A	IN
		1B	
		2A	OUT
		2B	
STANDBY	TB5	1A’	IN
		1B’	
		2A’	OUT
		2B’	

・Rotary Switch (SW1, SW2) (Built-in type board switch)



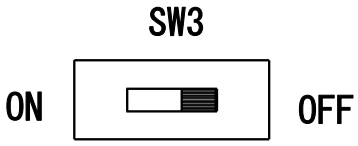
SW1 (2nd digit) SW2 (1st digit)

Item	Specification
SW2	Network address high order byte of PROFIBUS(7～F)
SW3	Network address low order byte of PROFIBUS(0～F)

* Setting range is 01 to 7D

*Address setting is 1 to 125

・Sliding Switch (SW3) (Users can NOT use)



Set the switch at R83 side (OFF side. Set by Seibu)

*Does not work properly when set to LED3 side.

・LED

	Status Specification
LED1	Status of MAIN LINE ON : Normal, OFF : Not communicating
LED2	Status of STAND BY ON : Normal, OFF : Not communicating
LED3	PROFIBUS Power status ON : MAIN and STANDBY Power is ON Flashing : MAIN or STANDBY Powe is ON OFF : Power is OFF

7) Transmission contents

The contents transmitted from our communication unit are as follows.。

Updating speed 9600bps, 15byte IN, 15byte OUT

<Input> <Output>

Item	Contents	Data length	Item	Contents	Data length
1	Command Signal	8bit	1	Status Display Signal	8bit
2	Position Command Signal (0~100) %	8bit	2	Position Signal (0~100) % Low order	8bit
3	Reset Signal	8bit	3	Position Signal (0~100) % High order	8bit
4	Blank	8bit	4	Abnormal Signal	8bit
5	Blank	8bit	5	No. of activations *Lowest order	8bit
6	Blank	8bit	6	No. of activations *Low order	8bit
7	Blank	8bit	7	No. of activations *High order	8bit
8	Blank	8bit	8	No. of activations *Highest order	8bit
9	Blank	8bit	9	Opening Current Max hold value	8bit
10	Blank	8bit	10	Closing Current Max hold value	8bit
11	Blank	8bit	11	Opening Torque Max hold value	8bit
12	Blank	8bit	12	Closing Torque Max hold value	8bit
13	Blank	8bit	13	Opening Torque value	8bit
14	Blank	8bit	14	Closing Torque value	8bit
15	Blank	8bit	15	Remote control operation	8bit

8) Bit MAP

Input) Item No.1 : Command Signal (Active=1)

High order	7	6	5	4	3	2	1	0	Low order

0bit : Open (1 shot or Continuous signal)
1bit : Close (1 shot or Continuous signal)
2bit : Stop (1 shot or Continuous signal)
3bit : Proportional control (Continuous signal)
4bit : Maintenance (Display maintenance sign on LCD)
5bit : Maintenance (Important valve) (Flashing full open lamp)
6bit : Blank
7bit : Blank

※Command priority : Maintenance > Proportional control > Stop > Close＝Open

Input) Item No.2 : Position Command Signal (0~100) %, every 1% (HEX 0 to 64)

High order	7	6	5	4	3	2	1	0	Low order

With Proportional Control, positioning command in every 1% from 0 to 100% (HEX0 to 64) is possible.

*Setting for every 1% is an electrical characteristic and may not be able to follow due to the backlash of mechanical mechanism.

Input) Item No.3 : Reset Signal (Active=1)

High order	7	6	5	4	3	2	1	0	Low order

Reset Self-Diagnostic data, Starting current / Starting torque Max holding value.

0bit : Starting current reset (1 shot signal)
1bit : Starting torque reset (1 shot signal)
2bit : Number of activation (1 shot signal)
3bit : Blank
4bit : Blank
5bit : Blank
6bit : Blank
7bit : Blank

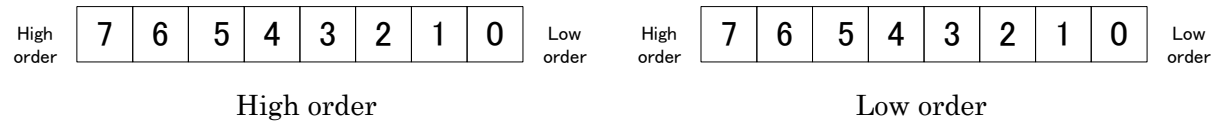
Output) Item No.1 : Status Display Signal (Active=1)

High order	7	6	5	4	3	2	1	0	Low order

Display the status of valve actuator

0bit : Fully Open Limit (Continuous signal on fully open limit operation)
1bit : Fully Closed Limit (Continuous signal on fully closed limit operation)
2bit : Opening (Continuous signal on opening operation)
3bit : Closing (Continuous signal on closing operation)
4bit : Open Torque Limit (Continuous signal on open torque limit operation)
5bit : Close Torque Limit (Continuous signal on close torque limit operation)
6bit : Remote operation mode (Continuous signal on remote operation, Local/OFF=0)
7bit : Local operation mode (Continuous signal on local operation, Remote/OFF=0)

Output) Item No.2,3 : Position Signal (0~100) % High/Low every 0.1% (0~3E8)

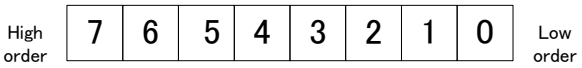


High order Low order

Output the position signal of actuator every 0.1%, 0 to 100% (HEX 0 to 3EB.)

*Setting for every 0.1% is an electrical characteristic and hysteresis occurs due to the backlash in the mechanical mechanism.

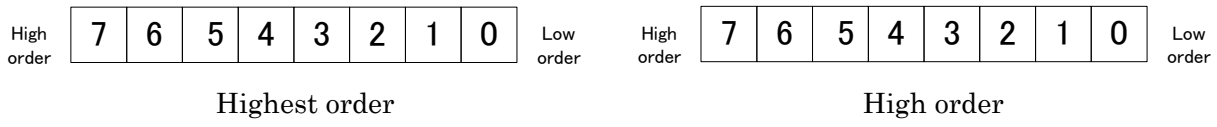
Output) Item No.4 : Abnormal Signal (Active=1)



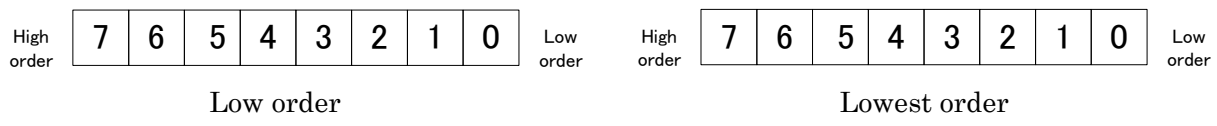
Display abnormal status of actuator.

0bit : Thermal error (Continuous signal at thermal abnormality)
1bit : AC open phase (Continuous signal at Main power open phase)
2bit : Exchange Electromagnetic contact (Continuous signal at life replacement time)
3bit : Motor rotation error (Continuous signal when idling motor)
4bit : Blackout on operation (Continuous signal at blackout while operation)
5bit : Invertor error (Continuous signal at invertor abnormality)
6bit : AD convertor error (Continuous signal at AD convertor abnormality)
7bit : Profibus Card error (Continuous signal at Profibus Card abnormality)

Output) Item No.5,6,7,8 : Number of activations 0 to 5 Million (HEX 0 to 4C4B40)



Highest order High order



Low order Lowest order

Output the number of activations of magnet conductor (reversible device) in actuator.
Output to the master machine as maintenance information for the reversible device (Able to reset with a reset signal)

Output) Item No.9 : Opening Motor Current Max Hold value, 0.0～25.0A output every 0.1A (0~FA)

High order	7	6	5	4	3	2	1	0	Low order

Output starting current Max value of actuator to opening direction every 0.1A in 0.0 to 25.0A (HEX0 to FA).

* Always output Max value and observe secular variation (Able to reset by reset signal)

Output) Item No.10 : Closing Motor Current Max Hold value, 0.0～25.0A output every 0.1A (0~FA)

High order	7	6	5	4	3	2	1	0	Low order

Output starting current Max value of actuator to closing direction every 0.1A in 0.0 to 25.0A (HEX0 to FA).

* Always output Max value and observe secular variation (Able to reset by reset signal

Output) Item No.11 : Opening Torque Max Hold value, 0～255 output upper 3 digits (0~FF)

High order	7	6	5	4	3	2	1	0	Low order

Output starting torque Max value of actuator to opening direction in 0 to 255, upper 3 digits .

* Always output Max value and observe secular variation (Able to reset by reset signal)

Ex.) When output 150Nm, output 150
When output 1,800Nm, output 180

Output) Item No.12 : Closing Torque Max Hold value, 0～255 output upper 3 digits (0~FF)

High order	7	6	5	4	3	2	1	0	Low order

Output starting torque Max value of actuator to closing direction in 0 to 255, upper 3 digits.

* Always output Max value and observe secular variation (Able to reset by reset signal)

Output) Item No.13 : Opening Torque value, 0～255, Output upper 3 digits (0~FF)

High order	7	6	5	4	3	2	1	0	Low order

Output torque value of actuator to opening direction in 0 to 255, upper 3 digits .

Output) Item No.14 : Closing Torque value, 0～255, Output upper 3 digits (0~FF)

High order	7	6	5	4	3	2	1	0	Low order

Output torque value of actuator to closing direction in 0 to 255, upper 3 digits .

Output) Item No.15 : Remote Control ON (Active=1)

High order	7	6	5	4	3	2	1	0	Low order

Output during remote control operation

0bit : Blank

1bit : Blank

2bit : Blank

3bit : Blank

4bit : Blank

5bit : Blank

6bit : Blank

7bit : Under Remote control operation (Continuous signal

9) ***GSD File***

＜Semflex-VM＞

```
; ==========================================================
; GSD-Date for P02304                Seibu
; Profibus-Modul 1-kanalig, max. 12MBaud
;
; Date name : SEIBOFCD.GSD
; ==========================================================
;
#Profibus_DP
GSD_Revision            = 1
Vendor_Name             = "Seibu"
Model_Name              = "PROFIDP-BRG-02"
Revision        = "1.00"
Ident_Number=0x0FCD
Protocol_Ident          = 0             ; 0 = PROFIBUS-DP
Station_Type            = 0             ; 0 = DP-Slave
FMS_supp                = 0             ; 0 = NOT FMS
Hardware_Release        = "A1.0"
Software_Release        = "Z1.0"
9.6_supp                = 1
19.2_supp               = 1
93.75_supp              = 1
187.5_supp              = 1
500_supp                = 1
1.5M_supp               = 1
3M_supp                         = 1
6M_supp                         = 1
12M_supp                = 1
MaxTsdr_9.6             = 15
MaxTsdr_19.2            = 15
MaxTsdr_93.75           = 15
MaxTsdr_187.5           = 15
MaxTsdr_500             = 15
MaxTsdr_1.5M            = 25
MaxTsdr_3M              = 50
MaxTsdr_6M              = 100
MaxTsdr_12M             = 200
Redundancy=0
```

```
Repeater_Ctrl_Sig=1
Implementation_Type="SPC3"
Bitmap_Device="Seibu_VM"
; Slave-Specification:
Freeze_Mode_supp        = 1
Sync_Mode_supp          = 1
Auto_Baud_supp          = 1
Set_Slave_Add_Supp=0
Fail_Safe=1
Min_Slave_Intervall     = 1
Max_Diag_Data_Len       = 6
Modul_Offset            = 1
Slave_Family            = 3             ;I/O
Modular_Station=1
Max_Module              = 1
Max_Input_Len           = 16
Max_Output_Len              = 16
Max_Data_Len            = 32
User_Prm_Data_Len       = 0
; Module-Definition-List
Module = "16DI/DO" 0x3F
EndModule
```

```
<Semflex-VP>
; ============================================================
; GSD-File for Seibu PROFIBUS UNIT (Type:PROFIDP-TBS-01)
; Profibus-Module 1-channel, max. 12MBaud
;
; File name : SEIB102E.GSD
; Version 1.1          Dec. 6, 2017
; ============================================================
;
#Profibus_DP
GSD_Revision            = 1
Vendor_Name             = "Seibu"
Model_Name              = "PROFIDP-TBS-01"
Revision          = "1.00"
Ident_Number=0x102E
Protocol_Ident          = 0             ; 0 = PROFIBUS-DP
Station_Type            = 0             ; 0 = DP-Slave
FMS_supp                = 0             ; 0 = NOT FMS
Hardware_Release        = "A1.0"
Software_Release        = "Z1.0"
9.6_supp                = 1
19.2_supp               = 1
93.75_supp              = 1
187.5_supp              = 1
500_supp                = 1
1.5M_supp               = 1
3M_supp                         = 1
6M_supp                         = 1
12M_supp                = 1
MaxTsdr_9.6             = 15
MaxTsdr_19.2            = 15
MaxTsdr_93.75           = 15
MaxTsdr_187.5           = 15
MaxTsdr_500             = 15
MaxTsdr_1.5M            = 25
MaxTsdr_3M              = 50
MaxTsdr_6M              = 100
MaxTsdr_12M             = 200
Redundancy=0
Repeater_Ctrl_Sig=0
```

```
Implementation_Type="SPC3"
Bitmap_Device="Seibu_VP"
; Slave-Specification:
Freeze_Mode_supp        = 1
Sync_Mode_supp          = 1
Auto_Baud_supp          = 1
Set_Slave_Add_Supp=0
Fail_Safe=1
Min_Slave_Intervall     = 1
Max_Diag_Data_Len       = 6
Modul_Offset            = 1
Slave_Family            = 3             ;I/O
Modular_Station=1
Max_Module              = 1
Max_Input_Len           = 16
Max_Output_Len                  = 16
Max_Data_Len            = 32
User_Prm_Data_Len       = 0
; Module-Definition-List
Module = "16DI/DO" 0x3F
EndModule
```